

STHREE RAKSHA: PANIC INTIMATION DEVICE FOR WOMEN

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Abstract: Women play an important role in empowering our economy and bringing a change in the country. Women earlier stayed indoors to perform their house old chores but are now balancing between work and home simultaneously. They are contributing to the economic development competing with men as well. They are working in both the day and night shifts. Women and girls are being assaulted, harassed, molested, and raped at all times. The world has become very unsafe for women and girls. A woman or a girl desires to be independent and move around freely without being concerned for their own security. In times of danger, they need not feel helpless or insecure if they have some sort of safety device with them. We propose a system which is the integration of multiple components. The hardware is a "Smart Device" which continuously communicates with a smart phone that has access to the internet. The device also ensures to provide live tracking feature which helps her family and friends to be intimated during times of panic.

Index Terms – Communication, IoT, Microcontroller, Women Safety.

I. INTRODUCTION

The world is an unsafe place for women in all aspects. The crimes against women are very high and it is rapidly increasing. Sthree Raksha proposes a quick responding mechanism that helps women during trouble. When the woman is in danger and she feels someone is going to attack her, she can press one of the buttons that is on the device based on the degree of danger. Immediately after she presses the button attached, the location of the woman is sent as an SMS alert and a notification on the mobile application to family and friends. The microcontroller used is ESP8266. It is interfaced with a push button, buzzer, speech circuit and a GSM module. When the button is pressed, it activates the speech circuit to alert the people in the surroundings for help. This device is developed to achieve real time response and demonstrate the system's capabilities. Thus, with the help of this device, the girl can feel safe and protected.

II. OBJECTIVE & SCOPE

We propose a microcontroller-based device which accepts input through the push buttons based on the level of danger, thus communicating with the smart phones in the form of SMS and notification on the mobile application. The device has access to location and messaging services which is configured in such a way that whenever it receives an input, it can send the location details to the saved numbers of her family and friends. From the notification/message sent by this device, people can take immediate action to help save the woman. The system aims to provide a low-cost safety device using simple components and technology for women which includes:

- Switching on and off the device.
- Identifying three levels of security of a woman through push buttons.
- Sending alert messages to family/friends.
- Live tracking facility through the application.
- Locating the woman in danger at frequent intervals of time.

III. LITERATURE SURVEY

A few authors have come up with security systems but with slightly different features, for example, a portable device was designed which could be activated as per the requirement of the individual. This device also locates the victim using GPS and with the help of GSM, SMS can be sent to the respective people as per the system design. The device provides a scream for help, an alarm system, and electric shocking system to get rid of the attacker [1]. Prof. Basavaraj Chougula et.al. propose a new alternative to use technology to protect women from panic situations. The device contains a belt which gets activated on detecting an attack, tracks the location of the woman who has been attacked using GPS and sends messages using GSM to the pre-saved contacts i.e. only to three contacts of family or friends and the police [2]. This system provides a GSM and GPS based vehicle tracking and women safety system that is implemented using the combined power of GPS device and specialized software in order to track the location of the vehicle. It also sends messages and alerts. The information of vehicle location provided by the system can be viewed on Google maps app [3]. Dr. Sridhar Mandapati et.al. have proposed a system with a push button using which the woman can alert family and friends saying that she is in danger, share her location. With this women safety android app, women will never walk alone and move around freely without any concerns. This women safety application needs the contact details people who are to be contacted in times of danger. Users can add multiple mobile numbers in the contacts list. These people will receive notifications in case the woman is in danger. All it requires is the user's action to trigger an SOS button given and it sends messages as fast as the system can manage. This application also provides necessary first-aid measures that should be taken care at the time of critical situations [4].

IV. SYSTEM DESIGN & BLOCK DESCRIPTION

The microcontroller, is the backbone of the system as it controls and initiates actions. It connects all the elements together, which make up the entire system. The hardware, i.e. LEDs, speaker, buzzer, push buttons and the GSM are all interfaced with the

microcontroller. The push buttons act as the input/trigger to the microcontroller. Depending on the kind of input it receives, the microcontroller will respond as per the proposed flowchart/model. The microcontroller will also send data to the mobile application via the Wi-Fi module embedded on it, using the internet. **Figure 1** is the block diagram of the whole system, it indicates how all the individual components are connected to the microcontroller.

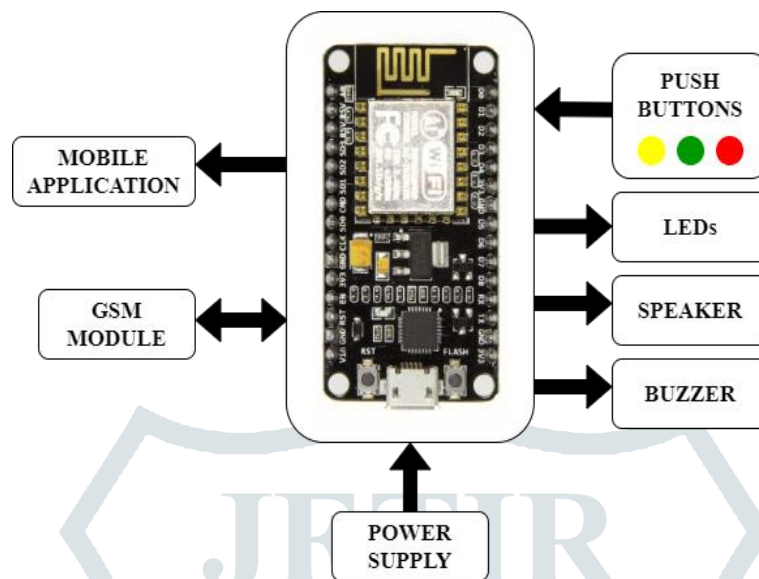


Fig 1. Block Diagram

Figure 2 is an image of the hardware implementation of the system. All the components have been soldered on general purpose PCBs as per the design. The hardware was passed through different test cases and the various signals were tested on the CRO. Finally, the microcontroller was programmed, to meet the requirements. Once, the whole system was programmed, the performance of the system was tested and verified.

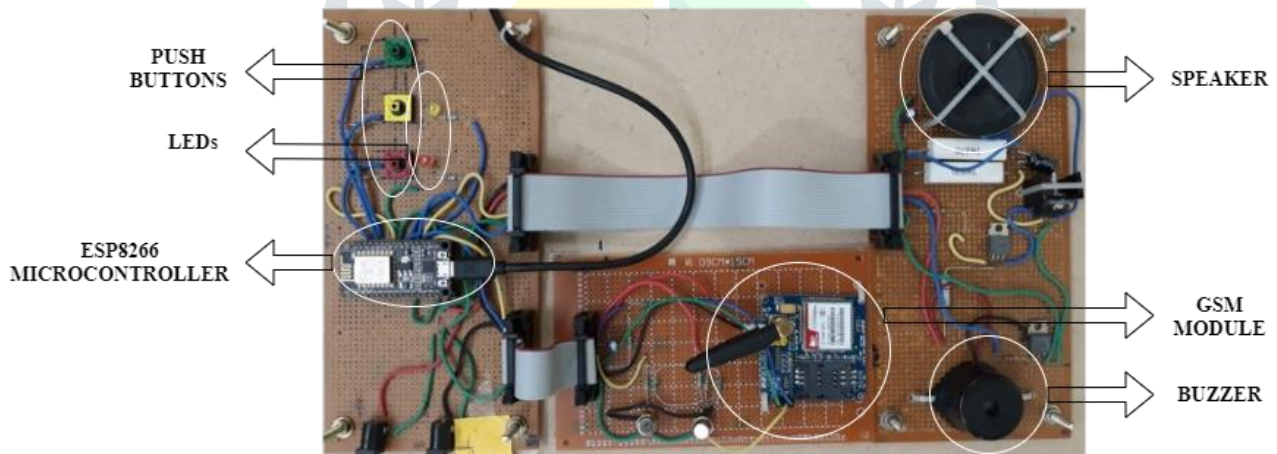


Fig 2. Hardware implementation

The mobile application has 3 main features:

1. Embedded google maps: it helps in tracking the location of the woman when in danger.
2. Groups: has a group making feature for immediate friends and family.
3. Notifications: pops notifications as per the status of the woman.

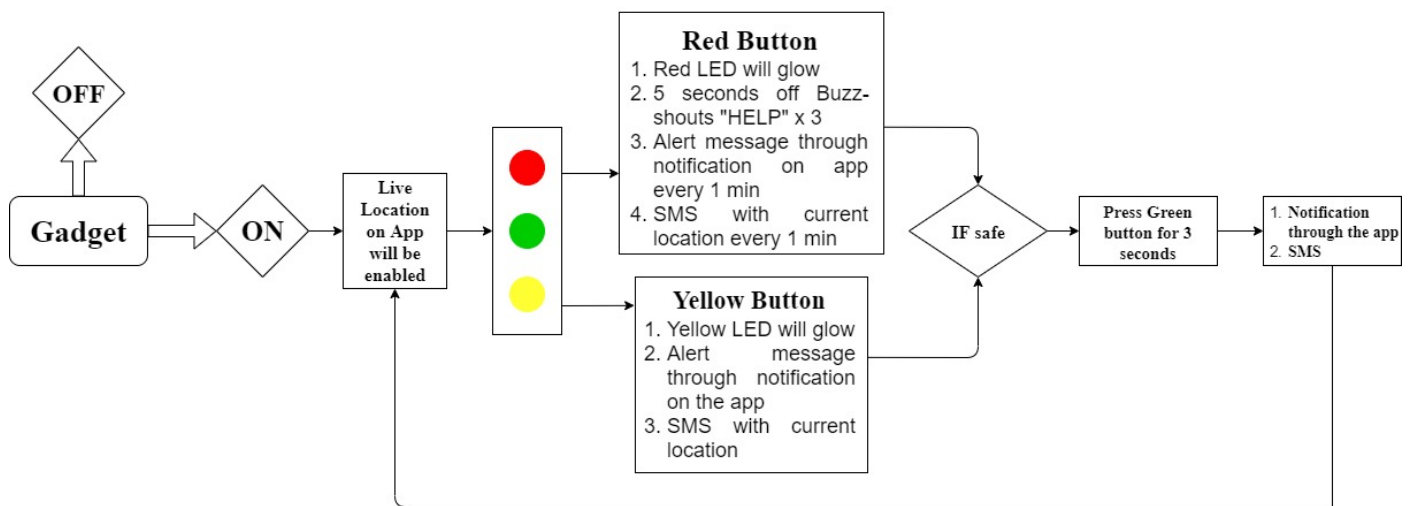


Fig 3. Flow chart

Figure 3 is the flowchart of the whole working of the system. It describes the behavior of the system for each instance.

4.1 Procedure

Device is in OFF state when there is no power given. Device goes into ON state when the power supply is turned on, using the power button. Once in the ON state, the device can be tracked on the app, which is the live location feature. This ensures, that this device can be tracked by family or friends on the app.

CASE-I: When a woman feels she is in danger (being watched or followed), in order to intimate her family and friends, she can press the Yellow button. Once the Yellow button is pressed, the yellow LED will glow, alert message through the notification feature on app will be enabled and will be sent at periodic intervals and SMS will also be sent, with the live location.

CASE-II: When a woman is in absolute danger and she needs help immediately, she can press the Red button. Once the Red button is pressed, the red LED will glow, a loud buzz noise will be triggered and a shout for “HELP” will also be triggered for 3 times, in order to alert the surroundings, that someone is in danger, alert message through notification feature on app will be sent every 1 min and SMS will also be sent, with the live location every 1 min.

CASE-III: Once a woman is safe and has reached her destination, but has pressed one of the above 2 buttons due to certain circumstances, she can press the Green button, in order to intimate her family and friends, that she is safe. But the Green button gets activated only when pressed for 3 seconds. A notification through the app and SMS is sent, telling that she is safe. And after this, the device goes back to the ON state, where the live tracking feature is on by default.

4.2 Communication

The data, in order to be received by the Android application, has to be sent via a cloud platform, as shown in Fig 4. Here, Thingspeak IoT Cloud platform has been used. The status of the push buttons on the hardware device is read and written into the channel on the cloud. And the data from the channel is read from the cloud by the android app, thus making it available for the user.

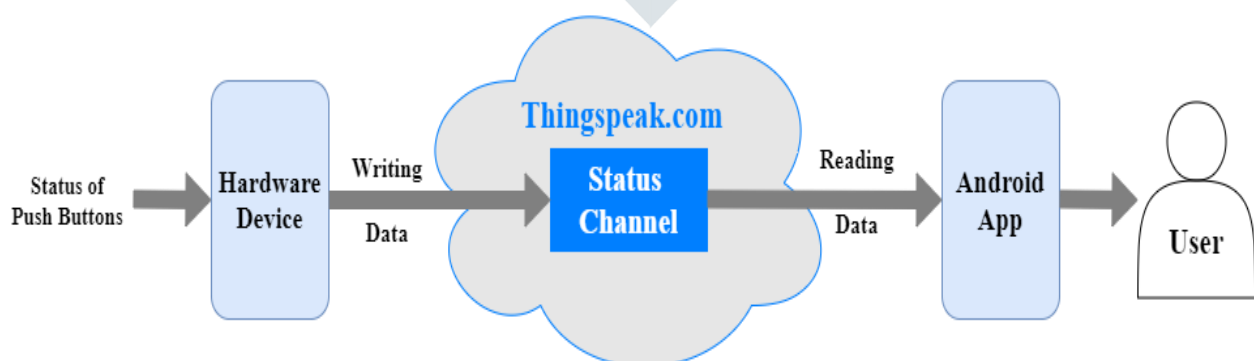


Fig 4. Communication

V. RESULTS AND DISCUSSION

The desired results of the proposed system, have been obtained. The location on the mobile application and the SMS message are being received by the smart phone. The data from the microcontroller is successfully transmitted to the Thingspeak IoT Cloud platform and the same is received on the mobile application. Figure 5 is the screenshot of the mobile application indicating the location of the woman in danger.

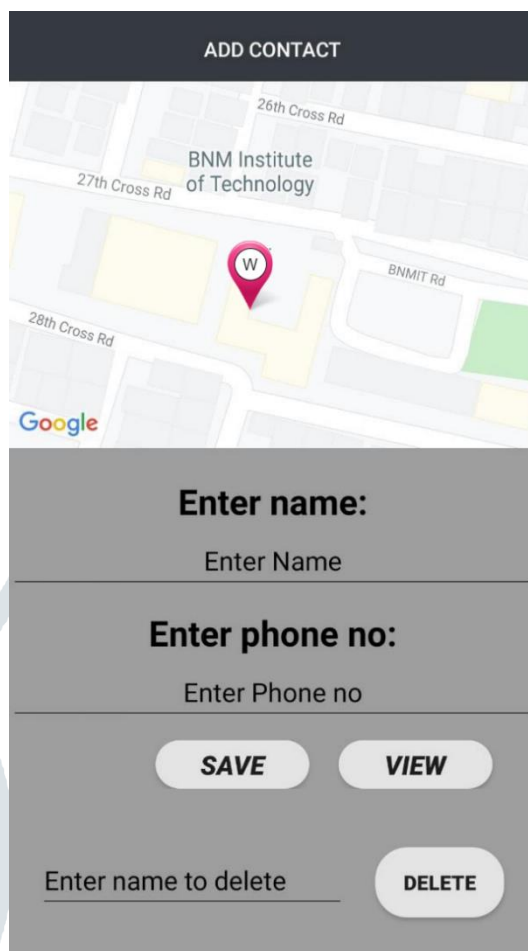


Fig 5. Map catching live location of the device

Figure 6 is the screenshot of the SMS message that is received by family and friends along with the google maps link, to track her location.

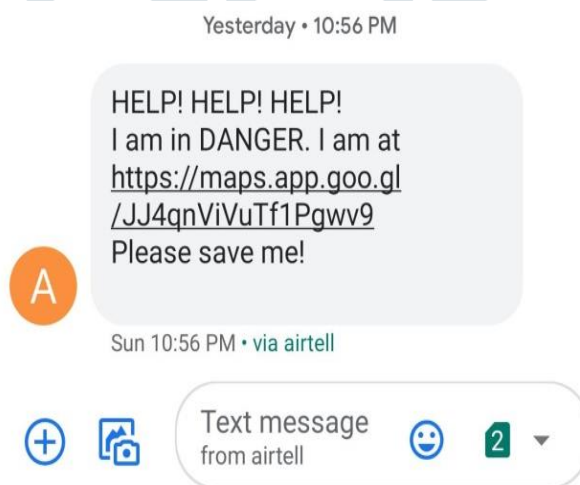


Fig 6. SMS and location link received using GSM

VI. MARKET POTENTIAL

We have seen a huge leap in the number of people using smart devices with advanced features. We can observe a rapidly increasing trend in the use of smart personal safety and security devices. Furthermore, the security concerns among women is further supporting the growth of personal safety and security device market across the globe. However, high market prices of these devices hinder the growth of this market. Hence, we need to come up with smart devices which are cost efficient and also which serve the required purpose.

VII. CONCLUSION

The system aims to implement the device at a very low cost which can save the lives of women in times of danger. This system uses simple hardware components along with the power of IoT to bring about a drastic change in the lives of women. It not only helps a woman in critical situations such as assault, rape, harassment and molestation but also provides a live tracking feature for family and friends, to be able to track her. There is future scope to enhance this device and further research can be made to develop this prototype into a consumer product.

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